WHAT IS CLAIMED:

1. An apparatus for performing combinatorial-chemistry synthetic reactions comprising:

a reaction vessel for containing a combinatorial-chemistry synthetic reaction, said vessel including an ingress aperture allowing a liquid to enter into an interior of said vessel and an egress aperture for aspirating the liquid from said vessel;

a liquid dispenser for dispensing the liquid through said ingress aperture;

a liquid aspirator for aspirating the liquid through said egress aperture, said liquid aspirator including a rotor for carrying said vessel and orbiting said vessel about an axis of rotation, said rotor oriented generally in a horizontal plane; and

an adjustment mechanism for adjusting the angle of the vessel relative to the horizontal plane in response to the centrifugal force generated by orbiting the vessel about said axis of rotation.

2. The apparatus of claim 1 comprising a plurality of vessels arranged in a reaction vessel array, said reaction vessel array having a substantially spatially-regular array of individual wells for simultaneous combinatorial chemistry synthetic reactions.

3. The apparatus of claim 2 wherein said reaction vessel array is a microtiter plate and said adjustment mechanism adjusts the angle of microtiter plate relative to the horizontal plane in response to the centrifugal force generated by orbiting said microtiter plate about said axis of rotation.

4. The apparatus of claim 2 wherein said liquid dispenser further comprises a reagent delivery station capable of selectively dispensing a plurality of reagents to respective vessels in said reaction vessel array.

5. The apparatus of claim 1 wherein said adjustment mechanism further comprises:

a plate holder for receiving and supporting said microtiter plate on said rotor;

a pivotal support for said plate holder at an outer end of said plate holder remote to the axis of rotation; and

a biasing mechanism for supporting an inner end of said plate holder intermediate said pivotal support and the axis of rotation, said biasing mechanism biasing said inner end in an upward direction thereby generally biasing said microtiter plate to a horizontal position;

whereby centrifugal force of rotation causes microtiter plate to pivot downwardly tilted position, with an inner end thereof lowering against the biasing force of the biasing mechanism.

6. The apparatus of claim 1 wherein,

the adjustment mechanism includes a counterweight carried by the plate below the pivot point of the plate for counterbalancing the plate.

7. The apparatus of claim 6 wherein

the adjustment mechanism further includes an adjustable stop for limiting the angular position of the plate.

8. The apparatus of claim 1 wherein said liquid dispenser includes a nozzle and a fluid port for supplying liquid to said nozzle, said apparatus further comprising a liquid fitting for releasably connecting nozzle and said fluid port, said liquid fitting including a biasing means located at one end of said nozzle and biasing said nozzle against said port, a barbed end located on an opposite end of said nozzle and releasably inserted into said fluid port.

9. The apparatus of claim 8 wherein said liquid fitting further comprises a guide member for properly aligning said nozzle with respect to said fluid port.

10. The apparatus of claim 1 wherein said reaction vessel is formed of a porous polymeric material.

11. The apparatus of claim 10 wherein said porous polymeric material is PTFE fluoropolymer resin, polyethylene, polypropylene, or PVDF homopolymer resin.

12. A method of performing combinatorial-chemistry synthetic reactions comprising the steps of:

providing a reaction vessel for containing a combinatorial-chemistry synthetic reaction, a liquid dispenser for dispensing liquid into said reaction vessel, and a rotor for orbiting said vessel about an axis of rotation, said vessel including an ingress aperture, an interior, and an egress aperture, said rotor oriented generally in a horizontal plane;

dispensing the liquid through said ingress aperture into said interior;

adjusting the angle of the vessel relative to the horizontal plane in response to the centrifugal force generated by orbiting the vessel about said axis of rotation.

aspirating the liquid through said egress aperture.

13. The method of claim 12 wherein said liquid dispenser further comprises a reagent delivery station capable of selectively dispensing a plurality of reagents to respective vessels in said reaction vessel array, said method comprising the step of selectively dispensing a plurality of reagents to respective vessels in said reaction vessel array.

14. An apparatus for dispensing liquids into a reaction vessel, said apparatus comprising:

a rotor mounted for rotation about a central axis, said rotor carrying an array of reaction vessels along a circular path;

a liquid dispenser including a plurality of dispensing nozzles, said liquid dispenser positioned above said rotor and arranged for dispensing a liquid from each dispensing nozzle into said a respective reaction vessel while said array of reaction vessels moves along said circular path past the liquid dispenser; and

a controller for synchronizing said liquid dispenser and said array of reaction vessels such that said liquid dispenser dispenses liquid into said array of reaction vessels while said rotor is moving.

15. An apparatus according to claim 14 wherein said liquid dispenser is moving along said circular path synchronized with said rotor when said liquid dispenser is dispensing liquid into said array of reaction vessels.

16. An apparatus according to claim 15 further comprising a plurality of linear actuators operably connected to said liquid dispenser and controlled by a controller, wherein said controller actuates said linear actuators such that said plurality of dispensing nozzles moves along said circular path.

17. The apparatus of claim 14 wherein said plurality of dispensing nozzles are arranged in a pattern matching the of array of reaction vessels.

18. A method for dispensing liquids into a reaction vessel comprising the steps of:

providing a rotor and a liquid dispenser, said rotor being mounted for rotation about a central axis and carrying an array of reaction vessels along a circular path, said liquid dispenser including a plurality of dispensing nozzles and being positioned above said rotor;

dispensing a liquid from each dispensing nozzle into said a respective reaction vessel while said array of reaction vessels moves along said circular path past the liquid dispenser;

synchronizing said liquid dispenser and said array of reaction vessels such that said liquid dispenser dispenses liquid into said array of reaction vessels while said rotor is moving.

19. An apparatus according to claim 18 further comprising the steps of:

moving said liquid dispenser along said circular path; and

synchronizing said liquid dispenser with said rotor when said liquid dispenser is dispensing liquid into said array of reaction vessels.

20. An apparatus for dispensing liquids, said apparatus comprising:

a plate having a first circular array of reaction vessels and a second circular array of

reaction vessels, said first and second circular arrays being concentrically arranged about a central axis; and

a plurality of dispensing nozzles arranged in a circular pattern above the plate, each dispensing nozzle mounted for radial movement about said central axis.

21. The apparatus of claim 20 further comprising a synchronizing translation mechanism for simultaneously moving said plurality of dispensing nozzles relative to said reaction vessels.

22. A system for performing combinatorial-chemistry synthetic reactions comprising an apparatus for dispensing liquids as defined in claim 20, a liquid dispenser for delivering reagents to said first and second arrays of reaction vessels, wherein said liquid dispenser includes said plurality of dispensing nozzles.

23. The apparatus of claim 20 further comprising:

a first member including a plurality of angularly spaced, radially extending linear slots spaced circumferentially about said central axis;

a second member including a plurality of angularly spaced, radially extending arcuate slots spaced circumferentially about said central axis, said arcuate slots being equal in number to said linear slots,

each of said plurality nozzles mounted for radial movement about said central axis, each said nozzle extending though a respective linear slot and a respective arcuate slot.

24. The apparatus of claim 23 wherein said first member is rotatable with respect to said second member whereby said nozzles move radially in response to relative rotation between said first and second members.

25. The apparatus of claim 24 wherein said arcuate slots have a curvature dimensioned to uniformly move said dispensing nozzles.

26. A method for dispensing liquids, said method comprising the steps of:

providing a plate having a first circular array of reaction vessels and a second circular array of reaction vessels, said first and second circular arrays being concentrically arranged about a central axis;

providing a plurality of dispensing nozzles arranged in a circular pattern above the plate, each dispensing nozzle mounted for radial movement about said central axis; and

simultaneously moving said plurality of dispensing nozzles relative to said reaction vessels.

27. The method of claim 26 further comprising the steps of:

providing a first member including a plurality of angularly spaced, radially extending linear slots spaced circumferentially about said central axis and a second member including a plurality of angularly spaced, radially extending arcuate slots spaced circumferentially about said central axis, said arcuate slots being equal in number to said linear slots; and

extending each said nozzle though a respective linear slot and a respective arcuate slot;

wherein said simultaneously moving step is accomplished by rotating said first member with respect to said second member thereby simultaneously moving each of said plurality nozzles radially about said central axis.

28. An apparatus for chemical synthesis utilizing a plate having a plurality of reaction wells therein, said apparatus comprising:

a plate holder for supporting the plate in a plurality of positions;

a first reagent dispensing nozzle positioned to dispense a reagent into said plurality of reaction wells for chemical reaction with chemical moieties within the reaction wells when said plate holder is supporting the plate in an upright position;

an inverting mechanism for inverting said plate holder and moving the plate between the upright position and an inverted position; and

a second solution dispensing nozzle positioned to dispense a solution into the reaction wells when the plate is inverted so that at least a part of the solution can drain by gravity from the reaction wells.

29. The apparatus of claim 28 wherein said plate holder and said inverting mechanism include a conveyor mechanism having an upper run for positioning the plate in the upright position and a lower run for positioning the plate in the inverted position.

30. The apparatus of claim 28 wherein the plate holder and the inverting mechanism include a support for carrying the plate, the support being rotatable in order to invert the plate.

31. A method for chemical synthesis utilizing a plate having a plurality of reaction wells therein, said method comprising the steps of:

providing a plate holder for supporting the plate in a plurality of positions, a first reagent dispensing nozzle for dispensing a reagent into said plurality of reaction wells for chemical reaction with chemical moieties within the reaction wells, and a second solution dispensing nozzle;

dispensing a reagent from said reagent dispensing nozzle into said plurality of reaction wells when said plate holder is supporting the plate in an upright position;

inverting said plate holder and moving the plate between the upright position and an inverted position; and

dispensing a second solution from said second solution dispensing nozzle into the reaction wells when the plate is inverted so that at least a part of the solution can drain by gravity from the reaction wells.